Data Sheet

Customer:	
Product:	Automotive Grade Thick Film Array Chip Resistor – CN..A Series
Size:	0402x4 / 0201x2(Flat) / 0201x4(Flat)
Issued Date:	08-Jul-25
Edition:	REV.B5

RoHS Compliant

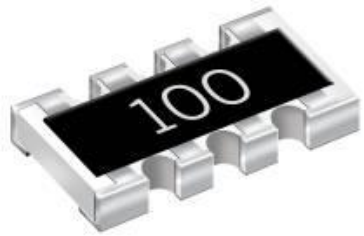
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08-Jul-25	08-Jul-25	08-Jul-25		
Alice Hsiao	***Susan Huang***	***Susan Huang***		

Automotive Grade Thick Film Array Chip Resistor



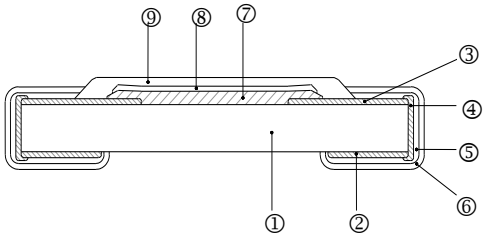
Scope

—This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.

Features

—AEC-Q200 Qualified
—Small size and light weight
—Reduction of assembly costs and matching with placement machines
—Reliability, high quality
—Special construction to prevent sulfuration in a sulfur containing environment
—Suitable for IR reflow soldering
—100% CCD inspection
—MSL: Level 1

Construction

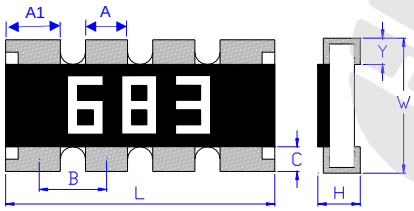


Applications

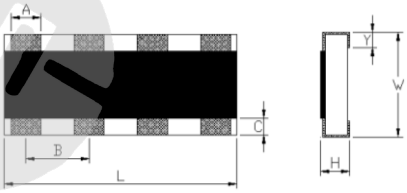
—Entertainment
—Computer & Related Products
—Communication Equipment
—Power Equipment
—Measuring Instrument

①	Alumina Substrate	④	Edge Electrode	⑦	Resistor Layer
②	Bottom Electrode	⑤	Barrier Layer	⑧	Primary Overcoat
③	Top Electrode	⑥	External Electrode	⑨	Secondary Overcoat

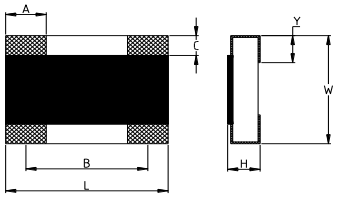
Dimensions



CN-42



CN-41



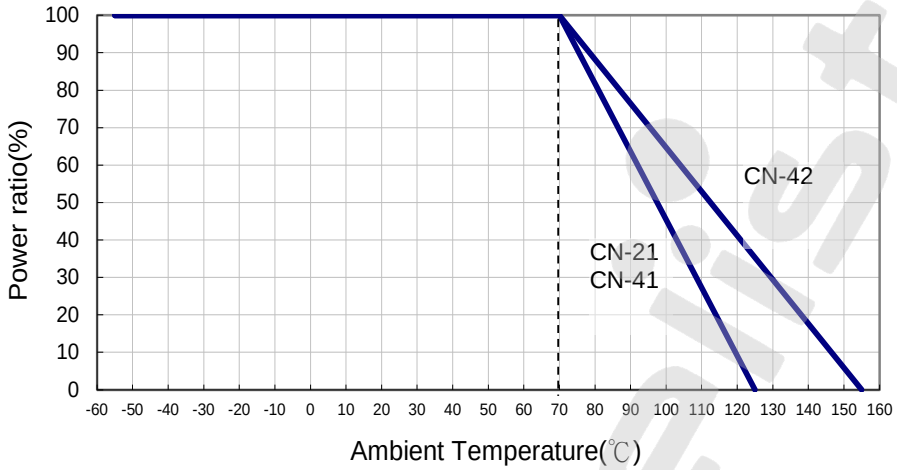
CN-21

Type	Number of Resistors	L (mm)	W (mm)	H (mm)	A (mm)	A1 (mm)	B (mm)	C (mm)	Y (mm)	Weight (g) (1000pcs)
CN-21	2	0.80±0.10	0.60±0.10	0.35±0.10	0.30±0.10	-	0.50±0.10	0.15±0.10	0.15±0.10	0.500
CN-41	4	1.40±0.10	0.60±0.10	0.35±0.10	0.20±0.10	-	0.40±0.10	0.10±0.07	0.15±0.05	0.833
CN-42	4	2.00±0.10	1.00±0.10	0.45±0.10	0.30±0.10	0.40±0.10	0.50±0.05	0.22±0.15	0.22±0.15	2.817

■Part Numbering

CN-	42	J	A	6	- - - 1 0 R
Product Type	Dimensions	Resistance Tolerance	Function Code	Packaging Code	Resistance
CN- (Array)	21: 0201x2 41: 0201x4 42: 0402x4	F: ±1% J: ±5%	A: Automotive Grade	6: 7” Reel 10Kpcs B: 10” Reel 20Kpcs C: 13” Reel 40Kpcs	- - - 1R2: 1.2Ω - - - 3K3: 3.3KΩ - - - 10K: 10KΩ - - 100K: 100KΩ “-“ to fill up 6 spaces

■Derating Curve

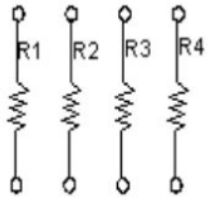


■Standard Electrical Specifications

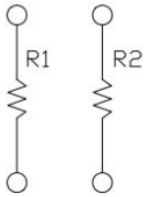
Item / Type	Power Rating at 70ºC Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Number of Resistors	Resistance Range ±1% (E24、E96)	Resistance Range ±5% (E24)	TCR (PPM/ºC)
CN-21	1/32W	-55 ~ +125°C	12.5V	25V	2	-	3Ω – 9.1Ω	±300
						10Ω - 1MΩ		±200
	Jumper: 0.5A					-	0Ω (<50mΩ)	-
CN-41	1/32W	-55 ~ +125°C	12.5V	25V	2	10Ω - 1MΩ		±200
	Jumper: 0.5A					-	0Ω (<50mΩ)	-
CN-42	1/16W	-55 ~ +155°C	25V	50V	4	10Ω - 1MΩ	1Ω - 1MΩ	±200
	Jumper: 1A					-	0Ω (<50mΩ)	-

Operating Voltage=$\sqrt{}$(P*R) or Max. operating voltage listed above, whichever is lower.
Overload Voltage=2.5*$\sqrt{}$(P*R) or Max. overload voltage listed above, whichever is lower.
■ Viking is capable of manufacturing the optional spec based on customer’s requirement.

■Equivalent Circuit Diagram

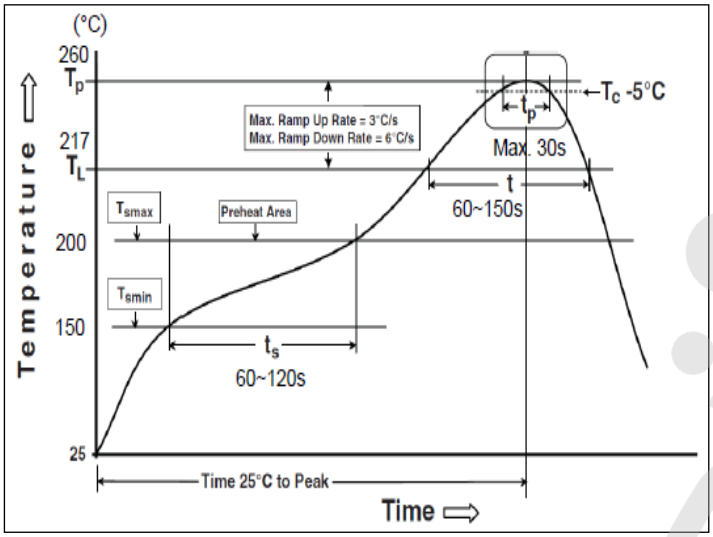


CN-41/CN-42



CN-21

■Soldering Condition (Ref. IPC/JEDEC J-STD-020 & J-STD-002)



Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat Min. Temperature (Tsmin) Max Temperature (Tsmax) Preheating time (ts) from (Tsmin to Tsmax)	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to Tp)	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217 °C 60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

■Environmental Characteristics

Item	Requirement			Test Method
	±1%	±5%	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.			**JIS-C-5201-1 4.8** **IEC-60115-1 4.8** At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	±(1.0%+0.05Ω)	±(2.0%+0.05Ω)	<50mΩ	**JIS-C-5201-1 4.13** **IEC-60115-1 4.13** RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	≥10G			**JIS-C-5201-1 4.6** **IEC-60115-1 4.6** Max. Overload Voltage for 1 minute
Operational Life	±(2.0%+0.10Ω)	±(3.0%+0.10Ω)	<100mΩ	**MIL-STD-202 Method 108** Condition D Steady State TA=125°C at derated power. Measurement at 24±4 hours after test conclusion.
Biased Humidity	±(2.0%+0.10Ω)	±(3.0%+0.10Ω)	<100mΩ	**MIL-STD-202 Method 103** 1000 hrs 85°C/85%RH 10% of operating power (≦100V)

Item	Requirement			Test Method
	±1%	±5%	Jumper	
High Temperature Exposure	±(1.0%+0.05Ω)	±(1.5%+0.10Ω) CN-21/41: ±(3.0%+0.10Ω)	<50mΩ CN-21/41: <100mΩ	**MIL-STD-202 Method 108** at +125/+155°C for 1000 hrs
Board Flex	±(1.0%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**AEC-Q200-005** Bending once for 60 seconds with 3mm
Solderability	95% min. coverage			**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** **J-STD-002** 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**MIL-STD-202 Method 210** 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover			**JIS-C-5201-1 4.7** **IEC-60115-1 4.7** 1.42 times Max. Operating Voltage for 1 minute
Leaching	Individual leaching area ≦5% Total leaching area ≦ 10%			**JIS-C-5201-1 4.18** **IEC-60068-2-58 8.2.1** 260±5°C for 30 seconds
Temperature Cycling	±(0.5%+0.05Ω)	±(1.5%+0.05Ω)	<50mΩ	**JESD22 Method JA-104** -55°C to +125°C, 1000 cycles
Mechanical Shock	±(0.25%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**MIL-STD-202 Method 213** Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**MIL-STD-202 Method 204** 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	±(1%+0.05Ω)			**AEC-Q200-002** Human body, 2KV
Resistance to Solvents	No visible damage on appearance and marking.			**MIL-STD-202 Method 215** Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Terminal Strength	No broken			**AEC-Q200-006** Force of 1.8kg for 60 seconds.
Flammability	No ignition of the tissue paper or scorching or the pinewood board			**UL-94** V-0 or V-1 are acceptable. Electrical test not required.
Sulfur Test	△R±1%	△R±5%	<100mΩ	**EIA-977 (Condition A)** 60±2°C, no power rating for 500 hrs.

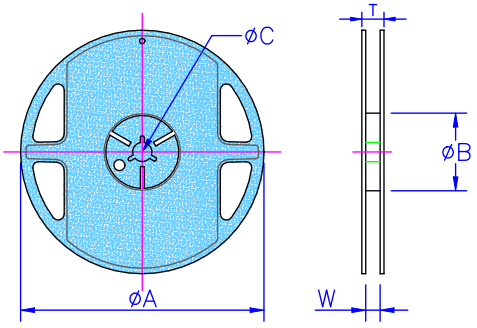
RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

■Storage Temperature: 15~28°C; Humidity < 80%RH

■Shelf Life: 2 years from production date.

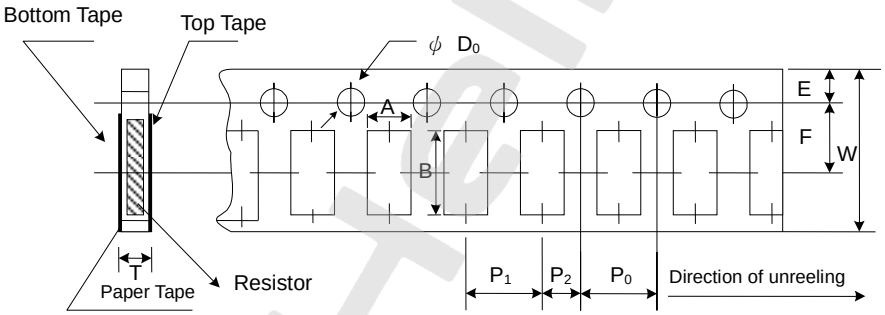
■Packaging

Reel Specifications & Packaging Quantity



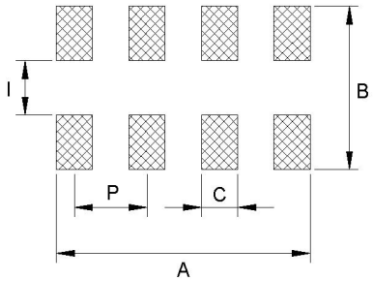
Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CN-21 CN-41	Paper	10K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
CN-42	Paper	10K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
		20K	8mm	10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		40K	8mm	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5

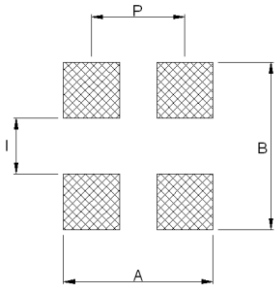
Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
CN-21	0.77±0.05	0.97±0.05	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	2.0±0.05	1.50+0.1,-0	0.50±0.1
CN-41	0.77±0.05	1.57±0.05	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	2.0±0.05	1.50+0.1,-0	0.50±0.1
CN-42	1.20±0.1	2.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	2.0±0.05	1.50+0.1,-0	0.70±0.1

■Recommend Land Pattern





Type	A (mm)	B (mm)	C (mm)	I (mm)	P (mm)
CN-21	0.80	0.90	--	0.30	0.50
CN-41	1.40	0.90	0.20	0.30	0.40
CN-42	2.10	1.80	0.30	0.50	0.50

■Marking

No Marking for CN-21/CN-41

Jumper for all: Letter “0”

1% for CN-42 : 4 digits marking (non-including E24 series)

Example:

Resistance	102Ω	2.49KΩ	30K1Ω	49.9KΩ	121KΩ
marking	1020	2491	3012	4992	1213

1% & 5% for CN-42 : 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

E24 code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A2	Apr 11, 2014		- Recommend Land Pattern updated
Version A3	Apr 30, 2015	-	- Environmental Characteristics updated
Version A4	Jun 15, 2016	-	- Remove Material Description - Modify Storage Temperature - Increase Product Size CN-21 & CN-41
Version A5	Jan 12, 2018	-	- Modify Electrical Specifications (0R)
Version A6	May 20, 2019	-	- Modify TCR Test description - Features added 100% CCD inspection
Version A7	Oct 21, 2019	-	- Increase Sulfur Test
Version A8	Jan 31, 2020	-	- Features added Anti-sulfur characteristics
Version A9	Sep 24, 2020	-	- Add CN-42/CN-43 Dimension A1
Version B	Mar 10, 2021	-	- Modify Soldering Condition
Version B1	Nov 15, 2021	-	- Increase the shelf life description
Version B2	Feb 15, 2022	-	- Derating Curve changes the temperature range
Version B3	Jun 15, 2022	-	- Modify Soldering Condition
Version B4	Jul 08, 2024	-	- Modify the descriptions in the Features
Version B5	Jul 08, 2025	-	- Modify the descriptions in the Features - EOL for CN-43..A Series